

# **Technical Resources for Engineering Efficiency (TREE) Team**

## **2002 Annual Report**

(August 2001 – June 2002)

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The TREE team completed 3 projects from August 2001 thru June 2002. These projects and other team activities during the last year are recapped below. New staff has been recruited and we are currently working on 2 projects at the same time (Del Monte in Toppenish and Encompass in Vancouver). As of August 2002; the team consists of: James DeMay; Linda Pang; Anise Ahmed; Lynn Coleman; Guy Hoyle-Dodson, Norm Hepner, Mike Lynch, Kathy Cupps, Marty Werner, Emma Johnson and Michelle Costenaro. The TREE team has representatives from six different programs within Ecology.

### **2002 Projects (August 01 – June 02)**

#### **Skills, Inc.**

Skills is a non-profit metal finisher of aerospace parts located in Ballard, Washington. Work began in August 2001 and ended in October 2001. TREE efforts with Skills focused on improving their plating and painting operations. Implementation of the opportunities would reduce hazardous waste by over 32,000 pounds each year, save 1.6 million gallons of water, and reduce wastewater generated by 1.6 million gallons per year. In addition the opportunities would save Skills about \$53,000 annually after all the required equipment is paid off. The payback period for the identified equipment is about 4 months. The total hours the TREE team spent on this project were 569.

#### **Saint Gobain Crystals and Detectors**

Saint Gobain manufactures crystals for the space and electronics industry. They are located in Washougal, Washington. Work began in November 2001 and the final report was submitted to them in February 2002. Opportunities identified could reduce their solid waste by 95 tons per year. The major opportunity was finding another reuse for their waste boron carbide cutting slurry. The total hours TREE team members spent on this project were 356.

#### **Independent Foods**

Independent Foods is a fruit canning facility located in Sunnyside, Washington. The team worked with Independent Foods to find ways to reduce their water usage, reduce their total dissolved solids (TDS) in their wastewater and reduce solid waste. The team focused primarily on optimizing their water softener, fixing leaks, installing control valves, replacing nozzles and recycling cardboard. Implementation of these identified opportunities would reduce water usage by 3 million gallons of water per year and would save around 80,000 lbs of chemicals per year. The payback period for the identified opportunities is about 6 months. The total hours TREE members spent on this project were 486.

**2002 TREE Summary**  
**(Predicted savings as outlined in TREE reports)**

**2002 Year End Report (8/01 - 6/02)**

**Skills, Saint Gobain, & Independent Foods**

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	<b>Total of 3 projects</b>		<b>Skills, Inc.</b>		<b>Saint Gobain</b>		<b>Independent Foods</b>	
<b>Total Investment (Cost)</b>	\$28,250	dollars	\$16,150	dollars	\$0	dollars	\$12,100	dollars
<b>Annual Savings</b>	\$183,700	dollars	\$52,900	dollars	\$108,000	dollars	\$22,800	dollars
<b>Payback</b>	0.2	years	0.3	years	0.0	years	0.5	years
<b>Water Reduction</b>	4,572,000	gallons/year	1,604,000	gallons/year			2,968,000	gallons/year
<b>Wastewater Reduction</b>	4,572,000	gallons/year	1,604,000	gallons/year			2,968,000	gallons/year
<b>Hazardous Waste Reduction</b>	32,300	lbs/year	32,300	lbs/year				
<b>Solid Waste Reduction</b>	95	tons/year			95	tons/year		
<b>Treatment Chemical Reduction</b>	79,600	lbs/year					79,600	lbs/year
<b>Process Chemical Reduction</b>	0	lbs/year						lbs/year
<b>Total Chemical Reduction</b>	82,900	lbs/year	3,300	lbs/year			79,600	lbs/year
<b>TREE Team Project Time</b>	1,410	hours	569	hours	356	hours	486	hours
<b>TREE Team Overhead</b>	684	hours						
<b>Total TREE Time</b>	2,094	hours						

## TREE Summary (1999 – 2002) Projected Totals

Project	Date	Total Investment (\$)	Annual Savings (\$)	Payback (years)	Water Reduction (gal/year)	Wastewater Reduction (gal/year)	Haz. Waste Reduction (lbs/year)	Solid Waste Reduction (tons/year)	Total Chemical Reduction (lbs/year)
Independent Foods	Jun-02	\$12,100	\$22,800	0.5	2,968,000	2,968,000			79,600
Saint Gobain	Feb-02	\$0	\$108,000	0.0				95	
Skills, Inc.	Oct-01	\$16,150	\$52,900	0.3	1,604,000	1,604,000	32,300		3,300
Welch's	Jul-01	\$110,600	\$136,800	0.8	42,000,000				
Basin Frozen Foods (II)	Mar-01	\$0	\$93,400	0.0	46,000,000				
TC Systems	Jun-00	\$41,500	\$44,300	0.9	3,039,800	55,200	25,600		92,700
Rainier Ballistics	Dec-99	\$74,600	\$26,800	2.8	116,362	13,203	20,800		6,290
Prototron Circuits	Oct-99	\$39,000	\$90,600	0.4	742,300		11,000		15,436
Basin Frozen Foods (I)	Jun-99	\$0	\$10,770	0.0	31,590,000				
Industrial Plating	Sep-98	\$50,000	\$250,000	0.2	6,500,000	6,500,000	101,000	0	
<b>Total:</b>		<b>\$343,950</b>	<b>\$836,370</b>		<b>134,560,462</b>	<b>11,140,403</b>	<b>190,700</b>	<b>95</b>	<b>197,326</b>

## **Other Accomplishments**

During the past year the TREE team has also worked on adding new members, marketing, and giving presentations. The team spent approximately 700 hours on these other projects.

During the past year we have recruited new members and expanded the team's staff and expertise. The team now has 11 members and the members come from a variety of programs. These programs include the Hazardous Waste & Toxics Reduction, Water Quality, Water Resources, Spills, Toxics Clean-up, and Solid Waste & Financial Assistance. We now have members in 3 of the regions and in HQ.

Marketing the TREE program internally and externally has also been a major focus this year. Some of the highlights included numerous presentations and articles to describe TREE and its services. We are currently finishing a major revision of our website and focus sheet.

## **TREE Results Reported by Former Candidates**

*The following information was obtained by contacting facilities that TREE worked with prior to 2000. Facilities were asked which opportunities they choose to implement and what the results were.*

### **Industrial Plating, Seattle (original TREE team candidate – September 1998)**

IP moved tanks and quit storing solution in tanks as suggested. These opportunities created room for extra rinse tanks that allowed IP to get cleaner rinsing with less water. They also began counterflow rinsing in their anodize and zinc lines. They still plan to implement other ideas but implementation is taking longer than Bob James (IP manager) would like. Bob believes that the best 'quick' measure of TREE's impact at IP can be seen in their water bill. Their annual water bill went from \$80,000 in 1996 to \$23,000 in 1999. Water use was 10 million gallons a year in 1996 vs. 3.5 million gallons a year in 1999. Hazardous sludge (F006) went from 160,000 pounds in 1996 to 59,000 pounds in 1999.

What is not as measurable is the good will and enthusiasm for Ecology engendered by TREE's work. At this year's generator workshop, Bob James gave a testimonial about TREE's services - stressing how much the team helped IP and that their services were free. He also raved about TREE at Metro's workshop for industrial dischargers in October 1999. Bob says "with our limited resources, we were able to achieve remarkable success with TREE" and "TREE got us on the road to continual improvement ...the TREE concept pays long term dividends that are good for the environment and good for companies – it's a win / win approach". Bob believes that "working with the TREE team is a real education, you can see where the opportunities are and how simple techniques can reduce waste and save money". Because of their achievements – IP was one of two companies to receive King County Industrial Waste's Envirovation Award in 1998.

### **Basin Frozen Foods, Warden (June 1999)**

The company implemented at least 2 of the team's 8 recommendations, including the opportunity the team saw as critical - move scrap potatoes without using water. Basin is using 85,000 gallons per day less water (saving over 22 million gallons a year) even though Basin has added a new french fry line. Their wastewater is also much cleaner now that scrap potatoes are not dissolving into their wastewater. Rich Tolman (Basin's plant manager) gives TREE "as high a recommendation as I can give" and said he was "glad they came down and gave us a hand". His reference was crucial to TREE gaining the confidence of Prototron Circuits. Rich believes continuing to implement the team's suggestions will reduce water use by an additional 90,000 gallons a day.

### **Prototron Circuits, Redmond (October 1999)**

Prototron is working with two of TREE's suggestions. They have trained their operators to increase hang time in order to reduce drag-out. Kevin Richardson, Prototron plating manager, feels that this will be a continual training opportunity for Prototron. They have also evaluated their rinsewater additions. As a result, they have cut back on fresh water additions to their automatic rinse cycles. Sometime in the future, Prototron plans to implement the ion exchange treatment system the team identified. Kevin Richardson "highly recommends" TREE to other companies. The team "didn't get in our way or anything" and "did their homework before they came". Kevin remembers the TREE team as "helpful and pleasant to work with" and he has "no problem giving them a reference - have people call me".

**Rainer Ballistics, Tacoma (December 1999)**

Rainer has already implemented two of the team's ideas (slow withdraw and longer hang times). The implementation of these opportunities has extended the life of a couple of their baths as much as 60%. They are testing a third TREE suggestion of using slotted barrels. The slotted barrels will reduce their drag-out by over 50%. Rainer also wrote a letter thanking Ecology for the help they received from the TREE team. The letter contains glowing praise for TREE's team and the resulting report from Rainer's plant manager Eric Hampton. Eric writes "my comfort and confidence grew with each day.." and "...helped show us ways to save money while reducing hazardous waste at the same time.."

**TC Systems, Everett (June 2000)**

TC Systems has completed one of TREE's suggestions and is currently working on implementing another. TREE found a water usage discrepancy of over 3 million gallons per year between their actual use and billing records from the city. During our evaluation TC Systems was being billed for 7.6 million gallons per year. Since our visit, TC Systems has fixed their water meter and replaced a water valve linking their two buildings. They are now using less than 2 million gallons of water per year. They are currently working on implementing TREE's suggestion of spray misting over the plating baths.

**Basin Frozen Foods II, Warden (March 2001)**

During our second visit the TREE team evaluated Basin's new French fry line. Since March, Basin has implemented two of TREE's suggestions. Before we arrived Basin was using approximately 704,000 gallons of water per day. They are now averaging around 534,000 gallons per day (May thru July 2001). This is a reduction of approximately 170,000 gallons of water saved each day. Don Wilson, Basin's plant manager, stated "this was a very successful project!"

**Welch's, Grandview (July, 2001)**

Could not contact Tom Brooke, plant engineer.

**Skills Inc., Ballard (October, 2001)**

Skills has completely revamped their plating room. They removed all of their plating tanks and refinished the room. This included sand blasting the walls and ceiling, painting, installing a new ventilation system, and resurfacing their sumps. They permanently removed their chromic acid plating line. Skills rearranged their tanks to simplify the process flow. They have also greatly reduced the number of hand dipping of plating buckets. They are in the process of implementing two more of the quantified opportunities listed by TREE. These are removing the manual hose in the plating room and installing their water filtration/recycling unit in the paint shop. Charlie Harris, Skills' Chief Executive Officer, stated "Using the TREE report, we redesigned and reconfigured our entire anodize building and operations with the specific goal of reducing resource utilization. The visibility of the TREE team during their visits and the resulting efficiencies of the finishing processes have motivated the operators of the facility to consider each action with an eye for resource conservation."

**Saint Gobain Crystals & Detectors, Washougal (February 2002)**

Saint Gobain has researched 4 of the 6 opportunities identified by the TREE team. Only six months later and they have already implemented 3 of the opportunities researched. These were reducing their solid waste, back flush and evaluate their waste coolant membranes, and they have purchased a drum crusher for their metal wire. They have started to remove the water from their waste boron

carbide slurry which has reduced their waste by 44% which should translate into around 42 tons per year. They have also instituted a formal facility wide recycling program. They recycle wood, plastic, florescent tubes, packaging material, paper, and metal.

Yvonne Cox, HR/HSE Manager, stated in their evaluation of the TREE team “It is an excellent way to learn new ideas and have the information and resources made known to a business on how to do things better. The team is another set of eyes to look at our processes. Sometimes those of us who work at a business cannot, “see the forest for the TREE’s” (pun intended!) because we live at the job every day. It was excellent to have the feedback. It confirmed that we do an excellent job on almost everything but we do have room to be creative in a couple of other areas.”



## **TREE Team**

The following staff are on the team as of June 2002.

James DeMay – HWTR SWRO. James is an environmental engineer with expertise in pollution prevention and process engineering. He is the team lead and spent 55% of his time on TREE activities.

Linda Pang – HWTR SWRO. Linda is an environmental engineer with expertise in both financial and system analyses. She has been a TREE team member since 1999. She has spent 40% of her time on TREE.

Anise Ahmed – WQ SWRO. Anise is an environmental engineer with expertise in water quality and water discharge permitting. He spent 25% of his time on TREE.

Norm Hepner – TCP CRO. Norm has fourteen years of environmental and industrial hygiene surveillance and compliance experience. In the past nine years with Ecology, he has worked in 5 agency programs [Nuclear Waste, Toxics Cleanup, Water Quality, Solid Waste, and Water Resources.] Norm joined the team in April 2001 and has spent 10% of his time on TREE.

Guy Hoyle-Dodson – WR HQ. Guy is a mechanical engineer with expertise in water conservation and wastewater treatment plants. He joined the team in April 2001 and spent 15% of his time on TREE.

Lynn Coleman – WR HQ. Lynn is an environmental engineer with expertise in water conservation and site remediation technologies. She joined the team in January 2001 and spent 20% of her time on TREE.

Kathy Cupps - WQ HQ. Kathy is an environmental engineer with expertise in water quality, wastewater treatment and water reuse. She joined the team in November 2001 and has spent 10% of her time on TREE.

Marty Werner – HWTR HQ. Marty is an environmental engineer with expertise in hazardous waste management, RCRA permits, and site remediation. He joined the team in November 2001 and spends 10% of his time on TREE.

Mike Lynch – Spills HQ. Mike has five years experience in investigating spills (and near-spills) and analyzing systems (physical and management) for the purpose of developing pollution prevention recommendations. He joined the team in November 2001 and spends 10% of his time on TREE.

Emma Johnson – SWFA NWRO. Emma has experience in composting, waste reduction, recycling, toxics reduction, technical assistance, and grant administration. She joined the team in March of 2002 and spends 10% of her time on TREE.

Michelle Costenaro – HWTR NWRO. Michelle is a chemical engineer with expertise in pollution prevention and process engineering. She joined the team in June of 2002 and spends 20% of her time on TREE.

## TREE Team FTE Levels

<b>Team Member (current)</b>	<b>Program</b>	<b>FTE Level</b>
Anise Ahmed	WQ - SWRO	0.10
Lynn Coleman	WR - HQ	0.40
Michelle Costenaro	HWTR - NWRO	0.20
Kathy Cupps	WQ - HQ	0.10
James DeMay (lead)	HWTR - SWRO	0.55
Norm Hepner	TCP - CRO	0.10
Guy Hoyle-Dodson	WR - HQ	0.15
Emma Johnson	SWFA - NWRO	0.10
Mike Lynch	Spills - HQ	0.10
Linda Pang	HWTR - SWRO	0.25
Martin Werner	HWTR - HQ	0.10
<b>Total</b>		<b>2.15 FTE</b>